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Using design thinking in engaging different stakeholders in development of higher education, decision making processes and policy making

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Abstract

This paper investigates the suitability of design thinking approach in engaging different stakeholders in development of higher education, decision-making processes and policy making to support the ongoing efforts of both policy and decision makers and higher education institutions in improving governance and capacity building in the natural resources and forest sectors. Case studies from Mozambique, Uruguay , South Sudan and UNICEF Nicaragua illustrate how design-thinking methods can and could be applied in policy and decision making and further development of higher education.

In general, design thinking requires a human-centered approach and participation. In human-driven policy making, policy makers are deliberately seeking a deeper understanding of the context and the lives of those the policy will affect and apprize how the policy should be designed. Well informed decision-making and design of relevant higher education can significantly benefit from this kind of approach as well. Comprehensive stakeholder involvement in planning of tuition and environment is important in building a suitable education program and unit to serve the purpose sustainably. Defining key areas for educational needs as well as the capacity needed to provide it are equally important in raising awareness both in academia as well as on the local level where theoretical knowledge can be brought to practice.

Key words: design-thinking, higher education, capacity building, governance, forests, natural resources, human-centered approach

Introduction

In the early stages of both policy and decision-making, it is pivotal to understand those the policy is affecting in order to create policies that reflect the needs, desires, capabilities and constraints of the people they are meant to serve. In addition, development of relevant higher education calls for similar approaches. Findings of multiple previous studies conclude that there is need for more focus on meeting the basic needs of local communities in a sustainable manner in natural resources management and socio-economical development of forests.

The concept of design thinking has gained a lot of attention during the past decades. Particularly in the business, management and information technology communities, design thinking has been identified as

an interesting and appealing new paradigm for dealing with complex and open ended challenges. (Stacey, Griffin, & Shaw, 2000). Design thinking integrates expertise from different fields such as social sciences, design, engineering and business. As a discipline it uses the methods and sensibility of designers in order to create solutions that match people's needs. Design thinking is executed best in the culture of vibrant communication and iterative learning cycles driven by rapid conceptual prototyping. The use of design thinking methods has resulted many innovative products, systems and services. (Brown, 2008) It is rather evident that design has also expanded beyond the traditional realm of design into new areas such as services, strategy, organization design, (e.g. Cooper, Junginger & Lockwood 2009; Kimbell 2009) institutional design and policy making.

Design thinking in policy making is a debated topic and many authors criticize the method for being empirically invalid and naive. (Wildavsky 1979, March and Olson 1989, Pierson 2000, Goodin 1996,Offe 1996). In this paper we discuss the suitability of design thinking approach in engaging different stakeholders in development of higher education, decision-making processes and policy making to support the ongoing efforts of both policy and decision makers and higher education institutions in improving governance and capacity building in the natural resources and forest sectors. Case studies from Mozambique, Uruguay , South Sudan and UNICEF Nicaragua illustrate how design-thinking methods can and could be applied in policy and decision making and further development of higher education.

On Design thinking

Design thinking is often described as the "designerly way of knowing" (Cross 2001) or how Designers think (Lawson 1980). Design thinking is often separated into two discourses: Johanson and Woodilla (2010) names them 'design discourse' and the 'management discourse'. The management discourse has more recent history as the design discourse goes back several decades, appearing around the 1960's (Johansson and Woodilla, 2010) The design discourse discusses "the way designers think as they work" whereas the management discourse discusses the need to improve managers design thinking skills for better business success and the use and usefulness of designer's working styles in other contexts outside the traditional design disciplines. (Johansson & Woodilla, 2010) Hereby in this article we discuss the application of design thinking from the management discourse perspective which regards design thinking as an overarching "method for innovation and creating value" (Johansson & Woodilla, 2010)

Hassi and Laakso (2011) are proposing a framework (table 1), which is summarizing the management view on design thinking based on interviews with experts on design thinking and review of selected literature. The the framework's purpose is to further the understanding of design thinking and it should be considered more as suggestive than conclusive. It presents the elements that are "interlinked and manifested through practices, thinking and mentality" in design thinking. (Hassi&Laakso 2011)

Design thinking can be outlined in three key dimensions: practices, thinking styles and mentality. The dimensions accommodate a set of elements common in design thinking - methods, values and concepts. The elements should be counted as overlapping descriptions of features related to design thinking, not as separate or exclusive units. (Hassi & Laakso 2011)

Table 1: Design thinking framework (Hassi&Laakso 2011)

PRACTICES	THINKING STYLES	MENTALITY
EXPERIMENTAL & EXPLORATIVE E.g. The license to explore possibilities, risking failure, failing fast (e.g. Brown 2008; Fraser 2007; Holloway 2009)	ABDUCTIVE REASONING E.g. The logic of "what could be", finding new opportunities, urge to create something new, challenge the norm (e.g. Fraser 2009; Lockwood 2009; Martin 2009)	HUMAN-CENTERED APPROACH E.g. People-based, user-centered, empathizing , ethnography, observation (e.g. Brown 2008; Holloway 2009; Ward et al. 2009)
AMBIGUITY TOLERANT E.g. Allowing for ambiguity , tolerance for ambiguity, comfortable with ambiguity, liquid and open process (e.g. Boland & Collopy 2004; Cooper et al. 2009; Dew 2007)	REFLECTIVE REFRAMING E.g. Rephrasing the problem, going beyond what is obvious to see what lies behind the problem, challenge the given problem (e.g. Boland & Collopy 2004; Drews 2009; Zaccai in Lockwood 2010)	THINKING BY DOING E.g. Early and fast prototyping, fast learning, rapid iterative development cycles (e.g. Boland & Collopy 2004; Lockwood 2010; Rylander 2009)
OPTIMISTIC E.g. Viewing constraints as positive, optimism attitude, enjoying problem solving (e.g. Brown 2008; Fraser 2007; Gloppen 2009)	HOLISTIC VIEW E.g. Systems thinking, 360 degree view on the issue (e.g. Dunne & Martin 2006; Fraser 2009; Sato 2009)	VISUALIZING E.g. Visual approach, visualizing intangibles, visual thinking (e.g. Carr et al. 2010; Drews 2009; Ward et aL. 2009)
FUTURE-ORIENTED E.g. Orientation towards the future, vision vs. status quo, intuition as a driving force (e.g. Drews 2009; Junginger 2007; Martin 2009)	INTEGRATIVE THINKING E.g. Harmonious balance, creative resolution of tension, finding balance between validity and reliability (e.g. Brown 2008; Fraser 2009; Martin 2010)	COMBINATION OF DIVERGENT AND CONVERGENT APPROACHES E.g. Ideation, pattern finding, creating multiple alternatives, (e.g. Boland & Collopy 2004; Drews 2009; Sato et al. 2010)
		COLLABORATIVE WORK STYLE E.g. Multidisciplinary collaboration, involving many stakeholders, interdisciplinary teams (e.g. Dunne & Martin 2006; Gloppen 2009; Sato et al. 2010)

The mentality dimension refers to the mentality of both the individuals immersed in the work and the mentality and culture of the organization: how the problems are approached and the orientation towards the work. The elements common in this dimension are experimental and explorative, ambiguity tolerant, optimistic, and future oriented. (Hassi & Laakso 2011) **The practices dimension** consists of elements that are connected with concrete activities: tangible approaches, the use of particular tools, activities and ways of working. The elements common in this dimension are: Human centered approach, thinking by doing, visualizing, combination of divergent and convergent approaches, and collaborative work style. (Hassi & Laakso 2011) **The thinking styles** dimension is linked to questions related to methods of thinking, processing information and cognitive styles. The elements common in this dimension are: abductive reasoning, reflective reframing, holistic view, integrative thinking. (Hassi & Laakso 2011)

Materials and Methods

In order to explore the process of child friendly policy making in Nicaragua, the research used qualitative approach on examining the available publications and articles by the different stakeholders that took part in the policy-making process. The case study approach was considered applicable, as the studied process does not have a clear-cut borderline with the context (Eisenhardt, 1989; Yin, 2003)

Case Nicaragua – Developing Regional Children's policy description

Infant and maternal mortality has dropped in Nicaragua's Regional Atlantic Autonomous Region (RAAN) during the past several years. The mortality rates are significantly higher in RAAN than in other parts of the country as many mothers continue struggling with supporting their and their babies health. The weakness of the health care services of mothers and infants deteriorates the health of both. Accessing the formal services is often frustrating for women which furthers the mistrust between women and the health providers discouraging women to seek for important care. The economic weakness, poor physical

infrastructure, conflicts, natural disasters and socio cultural complexity makes it challenging environment of policy making. (UNICEF 2013)

Since 2011 the government of Unity and National Reconciliation of Nicaragua, with the support of UNICEF, and the Regional Council and Regional Government of the Northern Atlantic Region have been working towards developing a regional policy for children. The aim of the policy was to create a framework that would guide the programmatic efforts to empower, protect and support creation of interventions that aids the realization of the rights of the children in RAAN. Recognizing the need for a holistic approach due to the complexity of the social environment, the regional leaders and UNICEF Nicaragua started to explore and adapt new approaches to policy making efforts. They saw the policy making process as an opportunity to engage both policy makers and their constituents' in the policy design process and thereby increase understanding of the factors shaping their lived experiences, culture of communities and development challenges. UNICEF Nicaragua engaged Reboot, a global social enterprise that has experience in bringing empathy to the policy making process , to provide external support to the efforts. (UNICEF 2013)

Table 2 . Case Nicaragua Policy Design Process

	Identifying challenges	Building empathy and understanding priorities	Making connections and finding entry points	Peeling the onion (Secondary data collection)	Reimagining the future	Looking forward
Activities	- Identifying key needs of children and their communities - Assessing conditions relating to children's development	- Returning to the communities to understand the residents aspirations, pain points and constraints relaring to the objectives and the stories behind the survey results - Clarifying needs, priorities, and contextual factors into development challenges	Identify key development objectives from which two were chosen for further investigation	Investigating the two development objectives -understanding people's lived experiences from multiple angles through service trials.	developing a set of actionable opportunities for the regional policy to consider during its subsequent implementation.	Translating the new understanding and fresh tool set into a final policy framework and accompanying applications.
Methods	- Quantitative survey including 23 indicators -Lots Qality Assurance Sampling Mehtods - Landscape view combined with desc research	Individual and group interviews, observations, community discussions, children showin their environment through photography, evaluation of community members priorities in the themes	Iinteractive synthesis techniques for analyzing findings	-Design research -Etnographic interviewing -observations -service trials -literature review -expert consultation -analythical synthesis	-Synthesizing findings trough variety of design excercises	-Investigating the remaining development objectives - prototype -refine interventions developed in response to the findings.
Stakeholders	- Indigenous communities in 7 territories - 133 respondents - Regional UNICEF staff , Reboot and policy working group	Policymakers from the Regional Council and Regional Government -Regional UNICEF staff - 350 residents -Children	Regional UNICEF staff , Reboot and policy	-3 local researchers -Community members - Regional UNICEF staff , Reboot and policy working group	- Local researchers - Regional UNICEF staff , Reboot and policy working group	Policy working group and UNICEF Nicaragua

Policy working group = local policymakers led by the Regional Secretariat on Women, Family and Children

Reboot tailored the methods and tools for research, synthesis, co-design process and their role was to provide training for the policy makers and document the process and to facilitate the implementation of the policy design process which is illustrated in table 2. The research instruments were modified according to the specific questions, crucial to each chosen development objective. Collaborating with the policymakers enabled transferring the skills and capacity that will support the use of human-centered approaches in policy making and sustainable implementation of the policy, the process resulted with.

Towards implementation

The Regional Children's policy was finalized in the end of 2013. However, due to changes in Government in early 2014, this policy has not been approved by the regional council. In 2014, UNICEF Nicaragua supported the Southern Caribbean Autonomous Region to go through a similar process as the one in RAAN. Building on the experiences of the process in the Northern region, the Social Policy team at UNICEF Nicaragua accompanied the Government representatives of the Southern Region without an external consultancy. As a result of this process, a Policy and Strategy for Children and Adolescents was finished and approved by the Regional Council in December 2014. At the moment, the Government is preparing, with support from UNICEF, to start to prototype some of the most innovative strategies identified through the Policy-making process. (Laakso M. 2015)

Case Mozambique - Educational module development in Environmental Engineering for Forest Sector Sustainability

Mozambique is among the most forested countries in Africa with 54.8 million hectares of forest land. There is growing interest among international actors to utilize currently non-productive forest lands through reforestation and eventual development of associated industry. Aalto University set up a joint project with Universidade Eduardo Mondlane in Maputo, Mozambique to distinguish the educational and development needs within the "Higher education and capacity-development for sustainability and clean technologies in the forest sector in Mozambique" (known as Vagalhão-project).

Case Uruguay - Developing a Master's of Science Program in Collaborative International Engineering Education, Environmental Technology and Sustainability

Uruguay has had long tradition of educational cooperation with its geographical neighbours mainly with Argentina and Brazil. Chemical and environmental engineering have long been included in university disciplines and as forest industry development advanced to a new level a major need for matching complementary education was apparent. Initiative came from the ministry of education and strong influence of the practical work and need for labor through international investments and direct need for matching education profile were noticed. In 2006, Universidad de la República from Montevideo made contact with Aalto University (then Helsinki University of Technology) for constructing a Master's degree program to suit these needs.

Case South Sudan

The path towards sustainable development in South Sudan has been full of challenges that a new nation is facing in its efforts to build capacity and infrastructure for a self-sustaining future. Deforestation, land degradation and desertification are still proceeding at an alarming rate. This case was part of the Project on Landscape Management Planning and Training for the Environment in South Sudan (LAMPTESS) and the field studies were conducted in 2009. The aim was to assess the capacity building priorities for the strengthening of good forest governance and sustainable forest management in Renk County.

Anaysis of the cases in the design thinking framework

The table 3. Evaluates the use of the "practice" dimension of design thinking in the four different cases. The mentality and thinking styles were mostly not taken into consideration in the table 3, since evaluating these dimensions from the perspective of all stakeholders would not have been possible without involving all the stakeholders.

Table 3. Analysis of the 4 case studies in the design thinking framework

	Nicaragua	Mozambique	Uruguay	South-Sudan
Human centered design	Human centered and empathic design were in the core of the policy design process	The study was carried out in practice with several workshops. questionnaires and online surveys to define the educational as well as networking aspects to develop further. People interviewed and participated included academia staffs and public and private sector representatives	-	Using human-centered design practices would have benefitted the creation of land-use policies that reflect the needs and capabilities of the local communities.
Thinking by doing	The policy design process was iterative. The outputs were tested and refined based on feedback from the people the policy will impact. The policy design team also ran service trials.	Variety of student projects e.g Master's thesis	Variety of student projects e.g Master's thesis	
Visualizing	-Visualizing mother's support networks. -Community children participated by contributing photos of their favorite and least-liked parts of their communities, showing the researchers their environ- ments through their eyes	not applicable	not applicable	not applicable
Collaborative working style	Multiple stakeholder collaboration: Regional policymakers, UNICEF Nicaragua, families, and community members	Main partners: Aalto University and Universidade Eduardo Mondlane in Maputo, Mozambique. -Planning phase included several visits to local and international work and education field from the design perspective of developing an education program.	Main partners: Department of Forest Products Technology of Aalto University and Facultad de Ingeniería Universidad de la República. Other partners: national forestry and related companies as well as a Uruguayan govern- mental research institute	Local communities wanted to establish good governance systems through partnerships with all actors and through increased local responsibilities.
Thinking styles	**Reflective reframing, Abductive reasoning** Turning selection of needs, priorities and contextual factors into key development challenges. Reframing the challenges into aspirations.	**Holistic view** The content of the study module: management and furthermore including the sustainability and life cycle aspects and the affiliated legislation, systems and tools for industrial environmental management. Interdisciplinary: Technology economy, the social and natural resources aspects and industry activities from environmental perspective.	**Holistic view** The mix of various interests can lay challenges for a program and for this reason detailed planning and discussion between all interest groups as well as perspective of technology, academic and scientific knowledge, pedagogy and economic mindedness were heard and considered as a whole.	**Mainly holistic view**

Leveraging design thinking for improving policy making and decision making

Adler (2014) explains that policy making is often following a fairly standard procedure: first a consultant is hired to perform the policy making process, then the consultant carries out a desk review analysis, they interview few key stakeholders and start drafting the policy in close doors. The consultant finalizes the process with consultation with civil society and validate the entire process. The policies that follow the described process will probably contain a long list of best practices from other countries and are well written, but there is a risk that they are disconnected from reality that the people face every single day. Policies that are results of this kind of process also tend to be so ambitious, that to be implemented they need a set of prerequisites that might not be readily available: money and capacity building. Implementing the policies might become overwhelmingly difficult.

Policy design is often considered as an exceptionally complex form of design (Steenhuisen 2013) and policy designers work is regarded as greatly different from the work of engineers and architects for example. Schön and Rein (1994) disagree with that view. They recognise that both policy designers and engineers deal with complex social structures and changing environments. UNICEF Nicaragua worked with Reboot and Policy Lab to adapt design tools to help these public employees think like designers when they introduced design thinking methods to the policy making context. Adler (2014) compares policy design process to designing phones: ”When a designer is designing a phone for example, they need to put themselves into the shoes of the consumers. In order to understand what kind of features they want in their phones, what kind of features they want or don’t their phones and what really makes them buy the phone. We applied the same logic for public employees.“

Conclusions and implications

The present study extends our understanding of the benefits of utilizing design thinking methods in policy making although it is evident that each process and project is unique and methods, thinking styles and mentality need to be adjusted according to the case. Design thinking can provide alternative approaches for policy design process especially in the case of social complexity as the designing disciplines have developed professional practices to deal with open and complex problems. (Dorst 2011) In the Nicaraguan policy making process, by channeling empathy into the policy making process, the policy makers got deeper understanding of the lived experiences of those the policy is affecting at all levels of the society. The process encouraged the policy makers to understand the perspectives of their constituents: their reality, needs and capabilities. This understanding got translated into how the policy was designed.

Policy making is ultimately a political activity. The approach used in Nicaragua created an atmosphere for collaboration and it nurtured shared experience for the institutional groups and the communities (Hammer 2013). Samantha Hammer (Hammer 2013), the research manager from the Reboot recognizes that this might not have been the case in another context. “There is no “off-the-shelf”” formula to pull out from here”. Steenhuisen (2013) agrees with that view “what works in one setting, does not automatically work in another.” Greater empathy is not necessarily a guarantee for more politically pleasing solutions either.

Implications in development of higher education

Reflecting the findings of this case against the idea of human-centered approaches (addressing needs/desires, capabilities and constraints) is useful. Many policy relevant and higher education related aspects can be identified in accordance with design-thinking taking into account participatory approaches and putting special emphasis on meeting the basic needs of local communities in a sustainable manner. Results of the village interviews and group discussions suggested that forest management was not sustainable at that time; deforestation was a major problem; the wood supply for various purposes was declining; the 5% tree cover rule was not applied and the main forest governance development priorities comprised a need to improve the public-community partnerships including provision of support and resources to the local communities by government institutions. In summary, no one seemed to be responsible for forest law enforcement and there were virtually no contacts between the forest authorities and the local communities at that time. The results suggest, however, that the local communities wanted to implement sustainable forest management, enforce the forest law, plant more trees and establish good forest governance if provided with necessary support and resources. Therefore, capacity building for training and extension could bring about many benefits provided that full utilization of the existing local governance and management systems and their traditional and customary knowledge and practices are taken into account. At the time of the field studies, the planned new forest law for Southern Sudan, based on an already existing new forest policy, was expected to recognize the roles of local-level actors, and it was recongnized that it could thus obviously facilitate the achieving of sustainable forest management.

References from our ongoing studies in Uruguay and Mozambique being published highlight that comprehensive stakeholder involvement starting from early planning stages can yield in considerable benefits when reviewing targeted outcomes. Enough time needs to be allocated to genuinely strengthen the capability of the local actor to build a solid base on which to work on and make sure the education finds the right audience. This means the knowledge base needs to be strong enough but more importantly, the project needs to make sure that this knowledge is not only transferred but applied to practice. Moreover, an educational institute cannot act entirely on its own but it needs the appropriate network of support and guidance for the project to meet the desired outcomes. Shared knowledge, practical skills and strong network of actors in the broad field (academia, public and private sectors, individual specialists) is of utmost importance in all cases to reach goals comprising multiple sustainability dimensions. The importance of sustainability in the educational field has increased substantially in recent years with a growth trend of environmental study programs. The challenge lies in holistic understanding of the essential dynamics: growth of the world economy and its direction while accounting the poor. The questions go beyond one discipline and are very socially connected when looking at lifestyles and Earth productivity. The nature of the issues requires true interaction between the industry, scholars, students and policy makers to reach environmentally sustainable business practices and policies (Cohen, 2011) At Aalto University various Master of Science programs have emerged lately discussing topics such as sustainable global technologies and principles of responsible management. To engage different actors when developing higher education as well as decision and policy making the scope and coverage of necessary topics are to be defined on continuous cycle to re-evaluate and refine needs. This continuous development approach is also to be used in the capacity building phase when such programs or modules are implemented in teaching.

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